

### Claims

What is claimed is:

1. A method for developing a first electronic resource for use within a network environment, the method comprising:

defining a plurality of instructions for rendering the first electronic resource for  
5 presentation to users;

declaring within the plurality of instructions a reference to a second electronic resource, wherein the reference comprises a link identifier associated with a network location for the second electronic resource; and

creating a reference file mapping the link identifier to a unique address corresponding to  
10 the network location on which the second electronic resource is stored, wherein the reference file is used by a server computer to abstract the unique address of the network location from the link identifier in order to prepare the first electronic resource for delivery to a client computer.

2. A method as defined in claim 1, wherein the creating act comprises:

15 incorporating into the reference file a plurality of link identifiers mapped to a plurality of unique addresses corresponding to network locations on which a plurality of electronic resources referenced within at least one other electronic resource maintained within the network environment are stored, wherein the second electronic resource is one of the plurality of electronic resources and the unique address of the network location for the second electronic  
20 resource is one of the plurality of unique addresses.

3. A method as defined in claim 2, further comprising:

compiling the reference file to render an index file and an associated data structure, wherein the index file relates each of the plurality of link identifiers to an entry of address  
25 information contained in the associated data structure, wherein the entries of address information each specify a unique address within the network environment where each of the electronic resources are stored, the index file and the associated data structure being in a format readable by the server computer for use in abstracting the unique address of the network location from the link identifier.

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4. A method as defined in claim 3, wherein each of the plurality of unique addresses comprises a service class identifying one of a plurality of server computers addressed by one of a plurality of domain names in the network environment.

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5. A method as defined in claim 4, wherein each of the plurality of unique addresses further comprises a directory path corresponding to a specific location on one of the plurality of server computers addressed by one of a plurality of domain names in the network environment.

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6. A method as defined in claim 5, wherein at least one of the plurality of unique addresses further comprises a query string of search parameters.

7. A method as defined in claim 1, wherein the reference file is in a format readable by the server computer.

8. A system for abstracting links to electronic resources within a network environment, the system comprising:

a plurality of link identifiers associated with a plurality of network locations on which a plurality of electronic resources are stored, wherein at least one of the plurality of link identifiers corresponds to a first electronic resource being referenced within a second electronic resource;  
and

a reference file mapping each of the plurality of link identifiers to a unique network address where an electronic resource is maintained within the network environment, wherein the reference file is used by a server computer to abstract the unique network address of first electronic resource from the link identifier in order to prepare the second electronic resource for delivery to a client computer.

9. A system as defined in claim 8, wherein the reference file is in a format readable by the server computer.

10. A system as defined in claim 9, wherein each of the plurality of unique addresses comprises:

a service class identifying one of a plurality of server computers addressed by one of a plurality of domain names in the network environment; and

a directory path corresponding to a specific location on one of the plurality of server computers addressed by one of a plurality of domain names in the network environment.

11. A system as defined in claim 10, wherein at least one of the plurality of unique addresses further comprises a query string of search parameters.

12. A system as defined in claim 8, wherein the reference file is compiled to yield an index file and an associated data structure, wherein the index file relates each of the plurality of link identifiers to an entry of address information contained in the associated data structure, wherein the entries of address information each specify the unique network address of an electronic resource maintained within the network environment, the index file and the associated

data structure being in a format readable by the server computer for use in abstracting the unique network address of first electronic resource from the link identifier.

13. A system as defined in claim 12, wherein each of the plurality of unique addresses  
35 comprises:

a service class identifying one of a plurality of server computers addressed by one of a plurality of domain names in the network environment; and

a directory path corresponding to a specific location on one of the plurality of server computers addressed by one of a plurality of domain names in the network environment.

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14. A system as defined in claim 13, wherein at least one of the plurality of unique addresses further comprises a query string of search parameters.

15. A system as defined in claim 8, wherein the second electronic resource comprises  
45 machine-readable instructions for rendering an electronic document.

16. A system as defined in claim 15, wherein the electronic document is a web page.

17. A system as defined in claim 8, wherein the network environment comprises the  
50 Internet.

18. A method for abstracting links to electronic resources in a network environment, the method comprising:

(a) retrieving from storage a first electronic resource, the first electronic resource comprising a reference to a second electronic resource within the network environment;

(b) examining the first electronic resource to locate a link tag corresponding to the reference, wherein the link tag comprises a link identifier associated with a network location for the second electronic resource and an executable routine for identifying a unique address for the network location;

(c) in response to locating the link tag, executing the routine to identify the unique address; and

(d) incorporating the identified unique address into the first electronic resource.

19. A method as defined in claim 18, wherein the retrieving act (a) is performed in response to receipt of a request for delivery of the first electronic resource to the client computer, the method further comprising:

(e) transmitting the first electronic resource with the identified unique address incorporated therein to the client computer.

20. A method as defined in claim 18, wherein the incorporating act (d) comprises: replacing the link tag with a reference tag specifying the identified unique address.

21. A method as defined in claim 18, further comprising:

(e) defining an index comprising a plurality of link identifiers, wherein each of the plurality of link identifiers corresponds to an electronic resource maintained within the network environment; and

(f) mapping each of the plurality of link identifiers defined in the index to an address information entry for use in identifying a unique address in the network environment where each of the electronic resources corresponding to one of the plurality of link identifiers is stored.

22. A method as defined in claim 21, wherein the executing act (c) comprising:

(c)(1) extracting the link identifier from the link tag; and

(c)(2) referencing the index with the extracted link identifier to locate the address information entry mapped to the extracted link identifier, wherein the located address information entry is used by the executed routine to identify the unique address specifying the storage location on which the second electronic resource is stored.

23. A method as defined in claim 22, wherein each of the unique addresses associated with one of the plurality of link identifiers comprises a first portion and a second portion, the first portion of each unique address being a particular domain name representing a server computer in the network environment on which electronic resources are stored and the second portion of each unique address being a directory path specifying a location on which a particular electronic resource is stored on the server computer corresponding to the domain name.

24. A method as defined in claim 23, wherein each address information entry comprises a service class identifying a particular server computer addressed by a particular domain name in the network environment, wherein the referencing act (c)(2) comprises: referencing the index with the extracted link identifier to determine the service class mapped thereto and using the determined service class to identify the particular domain name corresponding to the first portion of the unique address of the second electronic resource.

25. A method as defined in claim 24, wherein each address information entry further comprises the directory path corresponding to a specific location on the particular server computer corresponding to the particular domain name, wherein the referencing act (c)(2) further comprises:

referencing the index with the extracted link identifier to determine the directory path mapped thereto and appending the directory path to the particular domain name identified as corresponding to the first portion of the unique address of the second electronic resource, thereby completing identification of the unique address of the second electronic resource.

26. A method as defined in claim 25, wherein the defining act (e) comprises:

(e)(1) creating a link source file defining each of the plurality of link identifiers as being associated with an address information entry; and

65 (e)(2) compiling the link source file to yield the index and an associated data structure referenced by the index, wherein the associated data structure stores the service classes and the directory paths making up each address information entry in connection with an index pointer specified in the index for each of the plurality of link identifiers.

70 27. A method as defined in claim 23, wherein at least one of the unique addresses further comprises a query string of search parameters.

28. A method as defined in claim 18, wherein the examining, executing and incorporating acts are repeated for each link tag declared in the first electronic resource.

29. A method for preparing electronic resources for delivery to client computers in a network environment, the method comprising:

- (a) receiving a request for delivery of a first electronic resource to a first client computer;
- (b) retrieving from storage the first electronic resource;

5 (c) examining the first electronic resource to determine whether the first electronic resource includes a link identifier corresponding to a second electronic resource being referenced as a link within the first electronic resource;

(d) if a link identifier is detected within the first electronic resource, using the link identifier to identify a unique address specifying a storage location in the network environment  
10 on which the second electronic resource is stored;

(e) incorporating the identified unique address into the first electronic resource to generate a prepared first electronic resource; and

(f) transmitting the prepared first electronic resource to the first client computer to effectuate delivery of the electronic resource thereto.

15 30. A method as defined in claim 29, wherein the link identifier is included within a link tag declared within the first electronic resource, the incorporating act (e) comprising:  
replacing the link tag with a reference tag specifying the identified unique address.

20 31. A method as defined in claim 30, wherein the first electronic resource is processed by the first client computer to render a web page on a display device of the first client computer.

25 32. A method as defined in claim 31, wherein the reference tag is formatted as an href tag.

33. A method as defined in claim 29, wherein the using act (d) comprises:

(d)(1) defining an index comprising a plurality of link identifiers, wherein each of the  
30 plurality of link identifiers corresponds to an electronic resource maintained within the network environment; and

(d)(2) mapping each of the plurality of link identifiers defined in the index to an address information entry for use in identifying a unique address in the network environment where each of the electronic resources corresponding to one of the plurality of link identifiers is stored.

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34. A method as defined in claim 33, wherein the using act (d) further comprises:

(d)(3) extracting the link identifier detected within the first electronic resource; and

(d)(4) referencing the index with the extracted link identifier to locate the address information entry mapped to the extracted link identifier, wherein the located address

40 information entry is used to identify the unique address specifying the storage location on which the second electronic resource is stored.

35. A method as defined in claim 34, wherein each of the unique addresses associated with one of the plurality of link identifiers comprises a first portion and a second portion, the first  
45 portion of each unique address being a particular domain name representing a server computer in the network environment on which electronic resources are stored and the second portion of each unique address being a directory path specifying a location on which a particular electronic resource is stored on the server computer corresponding to the domain name.

50 36. A method as defined in claim 35, wherein each address information entry comprises a service class identifying a particular server computer addressed by a particular domain name in the network environment, wherein the referencing act (d)(4) comprises:

referencing the index with the extracted link identifier to determine the service class mapped thereto and using the determined service class to identify the particular domain name  
55 corresponding to the first portion of the unique address of the second electronic resource.

37. A method as defined in claim 36, wherein each address information entry further comprises the directory path corresponding to a specific location on the particular server computer corresponding to the particular domain name, wherein the referencing act (d)(4) further  
60 comprises:

referencing the index with the extracted link identifier to determine the directory path mapped thereto and appending the directory path to the particular domain name identified as

corresponding to the first portion of the unique address of the second electronic resource, thereby completing identification of the unique address of the second electronic resource.

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38. A method as defined in claim 37, wherein the defining act (d)(1) comprises:

(d)(1)(i) creating a link source file defining each of the plurality of link identifiers as being associated with an address information entry; and

(d)(1)(ii) compiling the link source file to yield the index and an associated data structure  
70 referenced by the index, wherein the associated data structure stores the service classes and the directory paths making up each address information entry in connection with an index pointer specified in the index for each of the plurality of link identifiers.

39. A method as defined in claim 33, wherein the defining act (d)(1) comprises:

75 (d)(1)(i) creating a link source file defining each of the plurality of link identifiers as being associated with an entry of address information for use in identifying a unique address in the network environment specific to each of the plurality of link identifiers; and

(d)(1)(ii) compiling the link source file to yield the index and an associated data structure referenced by the index, wherein the associated data structure stores the entries of address  
80 information in connection with an index pointer specified in the index for each of the plurality of link identifiers.

40. A system for abstracting links to electronic resources in a network environment, the system comprising:

an index file comprising a plurality of link identifiers associated with electronic resources maintained within the network environment, wherein the index file relates each of the link  
5 identifiers to an entry of address information specifying a unique location within the network environment on which each of the electronic resources are stored; and

a processing module operable to retrieve from storage a first electronic resource and extract therefrom a link identifier associated with a network location on which an electronic resource referenced in the first electronic resource is stored, the processing module referencing  
10 the index file with the link identifier to identify a unique address corresponding to the network storage location of the referenced electronic resource.

41. A system as defined in claim 40, further comprising:

a data structure referenced by the index and storing each of the address information  
15 entries in connection with an index pointer specified in the index to relate to each of the plurality of link identifiers.

42. A system as defined in claim 41, further comprising:

a link source file in which each of the plurality of link identifiers and associated address  
20 information entries are declared by an electronic resource developer; and  
a compiler for compiling the link source file to yield the index file and the data structure.

43. A system as defined in claim 42, wherein each entry of address information associated with one of the plurality of link identifiers comprises a service class identifying one of  
25 a plurality of server computers addressed by one of a plurality of domain names in the network environment.

44. A system as defined in claim 43, wherein each entry of address information associated with one of the plurality of link identifiers further comprises a directory path  
30 corresponding to a specific location on one of the plurality of server computers addressed by one of a plurality of domain names in the network environment.

45. A system as defined in claim 44, wherein the unique address for the referenced electronic resource comprises one of the plurality of domain names and the directory path to a specific location on the server computer addressed by the domain name.

46. A method as defined in claim 44, wherein at least one of the entries of address information further comprises a query string of search parameters.

47. A system as defined in claim 44, further comprising:  
a configuration module operable for analyzing the service class included in each of the address information entries to render a specific domain name associated therewith.

48. A system as defined in claim 47, wherein the configuration module is a text file relating each service class included in an address information entry to the specific domain name associated therewith.

49. A system as defined in claim 47, wherein the configuration module is an Extensible Markup Language (XML) file relating each service class included in an address information entry to the specific domain name associated therewith.

50. A system as defined in claim 40, wherein the first electronic resource comprises machine-readable instructions for rendering an electronic document.

51. A system as defined in claim 50, wherein the electronic document is a webpage.

52. A system as defined in claim 40, wherein the network environment comprises the Internet.

53. A computer program product accessible to a computing system and encoding a  
60 computer program for executing a computer process for preparing electronic resources for  
delivery to client computers in a network environment, the computer process comprising:

(a) receiving a request for delivery of a first electronic resource to a first client computer;

(b) retrieving from storage the first electronic resource;

(c) examining the first electronic resource to determine whether the first electronic  
65 resource includes a link identifier corresponding to a second electronic resource being referenced  
as a link within the first electronic resource;

(d) if a link identifier is detected within the first electronic resource, using the link  
identifier to identify a unique address specifying a storage location in the network environment  
on which the second electronic resource is stored;

(e) incorporating the identified unique address into the first electronic resource to  
70 generate a prepared first electronic resource; and

(f) transmitting the prepared first electronic resource to the first client computer to  
effectuate delivery of the electronic resource thereto.

54. A computer program product as defined in claim 53, wherein the link identifier is  
75 included within a link tag declared within the first electronic resource, the incorporating act (e)  
comprising:

replacing the link tag with a reference tag specifying the identified unique address.

55. A computer program product as defined in claim 53, wherein the using act (d)  
80 comprises:

(d)(1) defining an index comprising a plurality of link identifiers, wherein each of the  
plurality of link identifiers corresponds to an electronic resource maintained within the network  
environment; and

(d)(2) mapping each of the plurality of link identifiers defined in the index to an address  
85 information entry for use in identifying a unique address in the network environment where each  
of the electronic resources corresponding to one of the plurality of link identifiers is stored.

56. A computer program product as defined in claim 55, wherein the using act (d)  
90 further comprises:  
(d)(3) extracting the link identifier detected within the first electronic resource; and  
(d)(4) referencing the index with the extracted link identifier to locate the address  
information entry mapped to the extracted link identifier, wherein the located address  
information entry is used to identify the unique address specifying the storage location on which  
95 the second electronic resource is stored.

57. A computer program product as defined in claim 53, wherein the computer  
program product is a communications medium.

58. A computer program product accessible to a computing system and encoding a computer program for executing a computer process for abstracting links to electronic resources in a network environment, the computer process comprising:

(a) retrieving from storage a first electronic resource, the first electronic resource comprising a reference to a second electronic resource within the network environment;

(b) examining the first electronic resource to locate a link tag corresponding to the reference, wherein the link tag comprises a link identifier associated with a network location for the second electronic resource and an executable routine for identifying a unique address for the network location;

(c) in response to locating the link tag, executing the routine to identify the unique address; and

(d) incorporating the identified unique address into the first electronic resource.

59. A computer program product as defined in claim 55, wherein the retrieving act (a) is performed in response to receipt of a request for delivery of the first electronic resource to the client computer, the computer process further comprising:

(e) transmitting the first electronic resource with the identified unique address incorporated therein to the client computer.

60. A computer program product as defined in claim 58, wherein the incorporating act (d) comprises:

replacing the link tag with a reference tag specifying the identified unique address.

61. A computer program product as defined in claim 58, wherein the examining, executing and incorporating acts are repeated for each link tag declared in the first electronic resource.

62. A computer program product as defined in claim 58, wherein the computer program product is a communications medium.

63. A computer program product accessible to a computing system and encoding a computer program for executing a computer process for developing a first electronic resource for use within a network environment, the computer process comprising:

defining a plurality of instructions for rendering the first electronic resource for presentation to users;

declaring within the plurality of instructions a reference to a second electronic resource, wherein the reference comprises a link identifier associated with a network location for the second electronic resource; and

creating a reference file mapping the link identifier to a unique address corresponding to the network location on which the second electronic resource is stored, wherein the reference file is used by a server computer to abstract the unique address of the network location from the link identifier in order to prepare the first electronic resource for delivery to a client computer.

64. A computer program product as defined in claim 63, wherein the creating act comprises:

incorporating into the reference file a plurality of link identifiers mapped to a plurality of unique addresses corresponding to network locations on which a plurality of electronic resources referenced within at least one other electronic resource maintained within the network environment are stored, wherein the second electronic resource is one of the plurality of electronic resources and the unique address of the network location for the second electronic resource is one of the plurality of unique addresses.

65. A computer program product as defined in claim 64, the computer process further comprising:

compiling the reference file to render an index file and an associated data structure, wherein the index file relates each of the plurality of link identifiers to an entry of address information contained in the associated data structure, wherein the entries of address information each specify a unique address within the network environment where each of the electronic resources are stored, the index file and the associated data structure being in a format readable by the server computer for use in abstracting the unique address of the network location from the link identifier.

66. A computer program product as defined in claim 65, wherein each of the plurality of unique addresses comprises a service class identifying one of a plurality of server computers addressed by one of a plurality of domain names in the network environment.

67. A computer program product as defined in claim 66, wherein each of the plurality of unique addresses further comprises a directory path corresponding to a specific location on one of the plurality of server computers addressed by one of a plurality of domain names in the network environment.

68. A computer program product as defined in claim 67, wherein at least one of the plurality of unique addresses further comprises a query string of search parameters.

69. A computer program product as defined in claim 63, wherein the reference file is in a format readable by the server computer.

70. A computer program product as defined in claim 63, wherein the computer program product is a communications medium.